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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/589,675	06/07/2000	Steven C. Murray	PA1513US	8651

7590

01/15/2003

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EXAMINER

FARAH, AHMED M

ART UNIT

PAPER NUMBER

3739

DATE MAILED: 01/15/2003

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application No.
09/589,675

Applicant(s)
Murray et al.

Examiner
A. Farah

Art Unit
3739

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE three MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136 (a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on Nov 20, 2002
- 2a) ☐ This action is FINAL. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11; 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-33 is/are pending in the application.
- 4a) Of the above, claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1-33 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claims _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are a) ☐ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
- 11) ☐ The proposed drawing correction filed on _____ is: a) ☐ approved b) ☐ disapproved by the Examiner.
If approved, corrected drawings are required in reply to this Office action.
- 12) ☐ The oath or declaration is objected to by the Examiner.

Priority under 35 U.S.C. §§ 119 and 120

- 13) ☐ Acknowledgement is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
a) ☐ All b) ☐ Some* c) ☐ None of:
- ☐ Certified copies of the priority documents have been received.
 - ☐ Certified copies of the priority documents have been received in Application No. _____.
 - ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

*See the attached detailed Office action for a list of the certified copies not received.

- 14) ☐ Acknowledgement is made of a claim for domestic priority under 35 U.S.C. § 119(e).
a) ☐ The translation of the foreign language provisional application has been received.
- 15) ☐ Acknowledgement is made of a claim for domestic priority under 35 U.S.C. §§ 120 and/or 121.

Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892) 4) ☐ Interview Summary (PTO-413) Paper No(s). _____
- 2) ☒ Notice of Draftsperson's Patent Drawing Review (PTO-948) 5) ☐ Notice of Informal Patent Application (PTO-152)
- 3) ☒ Information Disclosure Statement(s) (PTO-1449) Paper No(s). 13 6) ☐ Other:

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DETAILED ACTION

Specification

1. The disclosure is objected to because of the following informalities: in page 7, line 3, the recitation "radiation source **102**" is inconsistent with the rest of the disclosure. Appropriate correction, such as --radiation source **106**-- is required.

Claim Rejections - 35 USC § 102

2. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless --

(e) the invention was described in a patent granted on an application for patent by another filed in the United States before the invention thereof by the applicant for patent, or on an international application by another who has fulfilled the requirements of paragraphs (1), (2), and (4) of section 371© of this title before the invention thereof by the applicant for patent.

3. Claims 1-3, 9, 12, 14, 17, 22-30, and 33 are rejected under 35 U.S.C. 102(e) as being anticipated by Jegorv et al. U.S. Patent No. 6,235,017.

As to claim 1 and 33, Jegorv et al. disclose a device for irradiating biological tissue, the device comprising:

a pump radiation source (pump laser **10**) for generating exciting radiation;

an optical waveguide (optical fiber **3**) coupled to the radiation source;

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a fluorescent element (laser crystal 6) positioned to receive pump radiation having a narrow spectral band (i.e., 1.12 μm) and to responsively generate emitted radiation, the emitted radiation having a peak emission (i.e., 3 $\mu\text{m} \pm 0.2 \mu\text{m}$) that is outside the narrow spectral band of the pump source; and

a redirector (laser converter 2 comprising protective coating and mirror surfaces 7 and 8) for directing the emitted radiation toward a tissue site.

In this Office Action, the term fluorescence is treated as *'the emission of electromagnetic radiation that is caused by the flow of some form of energy to the emitting body and which persists only as long as the stimulating radiation is continued.'* therefore, the device of Jegorv et al. comprises a fluorescent element (laser crystal 6).

As to claim 17, the redirector (laser converter 2) includes a reflective entrance face (coupling optic 5) and reflective walls (see Fig. 1), the entrance face having an aperture that admits pump radiation into the redirector.

As to claims 22-26, their device would inherently provide the method steps as presently claimed.

As to claims 27-30, their device is configured for the treatment of biological substance in stomatologic, endoscopic, dermatological, and the like procedures.

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Claim Rejections - 35 USC § 103

4. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

5. Claims 4-8, 10, 11, and 18-21 are rejected under 35 U.S.C. 103(a) as being unpatentable over Jegorv et al. in view of Sinofsky U.S. Patent No. 6,270,492 B1 and in view of Byren et al. U.S. Patent No. 4,853,528.

As to claims 18-21, Jegorv et al., described above, use waveguide/optical fiber to direct the treatment light to the tissue site. Hence, optical fibers inherently comprise reflective walls having a boundary between a waveguide core with a relatively high index of refraction and a cladding material having a relatively low index of refraction. Furthermore, coating the reflective walls with a metallic and/or dielectric coating is known in the art.

As to claims 4-8 and 11, Although Jegorv et al. disclose a fluorescent material, they do not particularly teach the use of liquid dyes or solid medium consisting of polymer as the active medium for fluorescing the incident radiation.

Sinofsky teaches a photo-therapeutic apparatus comprising a light-diffusing fiber tip assembly (10) having a radiation scattering particles (24) selected from a group consisting of a polymer, glass or suitable liquids (see Col. 9, lines 27-33). However, although Sinofsky teaches the use liquids fluorescent medium, he does not particularly teach the use of liquid dyes.

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As known in the art of non-linear optics, Byren teaches the use of nonlinear optical mediums (i.e., solid, liquid, or gas), which can be used for shifting light frequency. In one embodiment, he uses fluorescent dye as a frequency shifter.

Thus, it would have been obvious to one skilled in the art at the time of the applicant's invention to modify Jegorv et al. in view of Sinofsky and in view of Byren to have an alternative frequency shifting means (such as a polymer or liquid dyes) in order to select a wavelengths suitable for a particular/desired treatment.

6. Claim 13 is rejected under 35 U.S.C. 103(a) as being unpatentable over Jegorv et al. in view of Talpalriu et al. U.S. Patent No. 6,171,302 B1.

Jegorv et al., described above, do not teach that the incident radiation is delivered to the handpiece through an articulated arm.

However, Talpalriu teaches an alternative treatment apparatus and method for delivering therapeutic light to patient's skin. Fig. 2 of Talpalriu teach that the incident radiation is delivered to the handpiece through an articulated arm.

Thus, it would have been obvious to one skilled in the art at the time of the applicant's invention to modify Jegorv et al. with Talpalriu and use optical fiber or an articulated arm as an alternative light guides in order to deliver energy from external light source to handpiece for irradiating tissue.

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7. Claims 15, 16, 31, and 32 are rejected under 35 U.S.C. 103(a) as being unpatentable over Jegorv et al. in view of Braun et al. U.S. Patent No. 5,425,754.

Although Jegorv et al., described above, disclose a transparent window with a proximal face positioned adjacent to the fluorescent element, they fail to teach a means for cooling the window and the distal end of their window is not configured to contact the target tissue.

However, Braun et al. disclose an alternative method and device for irradiating tissues, the device comprising: a radiation source (lamp 8) for emitting a treatment light; a reflector (7), which directs the incident light toward the treatment site; a cuvette (4) consisting of casing (9) and two transparent “windows” (10), which are normal to the optical path of the incident radiation; and water (11) deposited inside the cuvette for cooling the target tissues. Thus it would have been obvious to one skilled in the art at the time of the applicant’s invention to modify Jegorv et al. with Braun et al. and have a tissue cooling window that is disposed between the irradiation source and the target site in order to cool the tissues, and to control and keep the temperature of the tissues at a desired level.

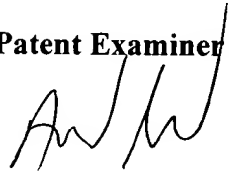
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Conclusion

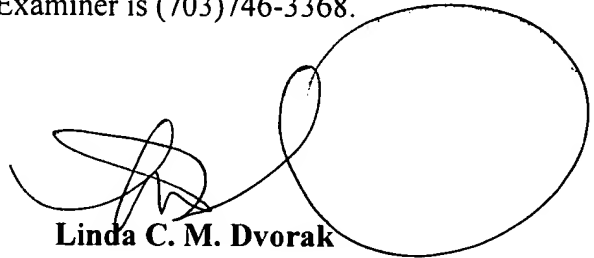
Any inquiry concerning this communication or earlier communications from the examiner should be directed to A. Farah whose telephone number is (703) 305-5787. If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Ms. Linda Dvorak, can be reached on (703) 308-0994. The fax number for the Examiner is (703)746-3368.

A. M. Farah

Patent Examiner (Art Unit 3739)



January 9, 2003



Linda C. M. Dvorak

Supervisory Patent Examiner